

7.7.

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Research done since receipt of PhD degree, September 1963:

I Mayan family

1. Paper: The Position of Tzeltal-Tzotzil in Mayan (Aug 1965; ms). Essentially a new classification of the Mayan family based on a fairly completely elaborated theory of historical Mayan phonology and using much more lexical and grammatical information than any previous attempt at classifying the Mayan languages.
2. Work on comparative Mayan phonology (intermittently since Sept 1963 to the present). Based on about 1000 etymologies, which has succeeded in discovering all the regular sound correspondences and in reconstructing the structural features of proto Mayan phonology; certain features of the reconstruction could be placed on a more solid footing only with the use of considerably amplified data (which is not at present available).
3. Paper: Evidence for the Macro-Mayan Hypothesis (Nov 1964; ms). This paper examines the thesis that the Mayan, Mixe-Zoque, and Totonacan families form a (non-exclusive) genetic group, examining all the lexical and phonological similarities so far uncovered, and coming up with the conclusion that the hypothesis is probably sound, but inherently incapable of very detailed proof.
4. Mayan Etymological Dictionary Project (in progress). This project aims to compare standard lexical lists (with grammatical notes) of over 1400 items in all the Mayan languages in order to establish a basic core of Mayan etymologies. The work involves getting questionnaires filled out (9 out of 25 are done), punching cards with lexical items, and collating cognates. This will probably be a two or three year project, and has just

begun.

## II Mixe-Zoque family

1. A comparative phonology, grammar, and dictionary of the Mixe-Zoque family was prepared in draft form in the first half of 1963. During the first half of 1965 the monograph entitled Mixe-Zoque Diachronic Studies has been revised in the text and the etymological dictionary expanded by about one-fourth.

2. "Reconstitution" of Tapachultec (March - April 1965).

Tapachultec is quite possibly extinct, and is attested in only 5 short and not very accurate word lists; but the application of philological methods to these lists, along with a knowledge of other languages in the family, allows one to salvage and interpret most of the extant material.

## III Siouan family

1. Siouan etymological file (winter 1963-64); ca. 500 entries. This file incorporates all of Wolff's and Matthews' etymologies (250-300 in all) plus 200-250 new etymologies discovered by me. There are 13 Siouan languages.

2. Catawba lexical file (winter 1964). A slip file of every bit of published material on Catawba, including Speck's Catawba Texts. A lot of unpublished material on Catawba exists, so that this file is by no means complete.

3. Mandan lexical file (winter 1964). Includes all published (probably also extant) material on Mandan, which is quite amenable to the application of philological methods.

4. Reconstruction of proto Siouan phonology (winter-spring 1964). Although 2 formulations of comparative Siouan phonology are

in existence, both are subject to much improvement, which my studies have made.

(5. Dakota materials gathered during the course of 1964-65, while teaching 220.)

#### IV Uto-Aztecan

1. Uto-Aztecan etymological file (fall-winter 1964-65); ca. 500 items. Includes all the etymologies in Miller's unpublished study and in the Voegelins', Hales, and Whorf's published studies, plus a small number of etymologies discovered by myself.
2. Modifications of Uto-Aztecan comparative phonology (winter 1965). Some improvements and amplifications over Voegelins - Hale and Whorf have been made.
3. Cora-Huichol etymological file (winter 1965). An etymological vocabulary of the Coran subgroup (ca 200 sets).
4. Plateau etymological file (winter 1965). An etymological vocabulary of the Plateau subgroup (ca 250 sets).
5. Plateau comparative phonology (spring 1965). A detailed study of the comparative phonology of the Plateau group shows that a certain amount of simplification can be made in the Voegelins' and Hales' formulation.
6. Tarahumara morphophonemics (spring 1965).

#### V Other families.

1. Lencan linguistic materials (spring 1965). The two lencan languages are almost extinct but considerable data (up to 1910) exists on them. All extant data has been slipped and filed; philological methods are being applied to determine the phonological systems of the languages and to provide normalized

transcriptions of the morphemes and lexical items (ca 800-900 reconstitutions).

2. Matagalpa linguistic materials (fall 1963). Most of the data on the two varieties of this nearly-extinct language have been slipped, collated, and interpreted; the job is almost but not quite complete (ca 300 reconstitutions).

3. Xincan linguistic materials (spring 1965). Slipping and filing of all extant data on the two almost extinct Xincan languages has been begun.

(4. Tumbuka (Bantu) materials gathered during spring of 1964 while teaching a field methods course at Ohio State University.)

#### VI Field Work

1. Tzotzil syntax; one week in June 1965.

2. 5 Zapotec 100 word lists

3. 1 Chinantec 100 word lists

} 3 days in June 1965

#### Committee Work Done in Linguistics Department, University of California, Berkeley

1. Library Committee (1964-65)

2. Undergraduate Advisor (1965-66)

3. Scheduling Courses (1965-66)

Evidence for the Macro-Mayan Hypothesis

T. Kaufman

Handout to  
accompany paper

# proto-Mayan Phonemes

## 1. segments

C:	p	t	c	k	q	
		t <sup>y</sup>	č	k <sup>y</sup>		
stops		t <sup>w</sup>	c <sup>w</sup>	k <sup>w</sup>		plain and glottalized
	b'				ʔ	
spirants			s	x	h	
			ʃ			
resonants	m	n		ŋ		
		l				
	w		y			
V:	i	ʌ	u		v'	
	e	a	o			

## 2. canons

H x k h ʔ °

roots: CVC  
CVHC  
CVCVC  
CVHCVC  
CVCVHC

2a initial clusters ? + resonant

4 alternations

t-c-k

k-q

x-h

h-ʔ

c-č



# Mayan Sound Correspondences

p s m n i e a o u remain unchanged in all languages.

All k's become c in Hua, otherwise k remains in all languages.

l becomes r in Lac and Chr, otherwise l remains in all languages.

pM *	b	p	t	t <sup>y</sup>	t <sup>w</sup>	c	č	c <sup>w</sup>	k	k <sup>y</sup>	k <sup>w</sup>	q	?
Hua	b		t,č	t,č	t,č	t	č	?		c		k	?,č
Lac	b	p	t,č	t,č	t,č	c,č	č	?	k	k,č	k	k	?
Chl	b	p		t		c	č	c	k		č	k	?
Tzo	o	p		t		c	č	c	k		č	k	?
Toj	p			t		c	č	c	k	č/k		k	?
Chj	p		t		č	c	č	c		č/k		k	?
Jac	p		t		č	c		c	k	k,č,c		x	?
Mam	b		t	c	č	c		c		k,k <sup>y</sup> ,č		q	?,č
Cak	b		t	č	t	c	č	c	k	k <sup>y</sup>	k	q	?
Pch	b		t	č	t,č	c	č	c		k		q	?
pM *	č	x	h	ŋ	y	ŋjy	Λ	w	?w				
Hua	č	h	h,?, w,b,y	w,h,?y	y	y	a	w,b	?				
Lac	č	h	h	n	y	y	Λ,a	w	w				
Chl	č	h	h	n	y	y	Λ,a	w	w				
Tzo	č	x	h	n	y	y	o	w	w				
Toj	č	h	h	n	y	y	a	w	w				
Chj	č	h,?	h,č	ŋ	y	y	a	w	w				
Jac	a	h	h	ŋ	y	y	a	w	w				
Mam	a	x	?,č	x	č	č	a	w	w				
Cak	č	x	w,y	x	r	y	a	w	w				
Pch	č	x	h,č	x	r	y	a	w	w				

pm	*CVC	CV'C	CV?C	CVhC	CVxC
Hua	CVC	CV'C	CV'C	CV'C	?
Lac	CVC	CVVC	CV?VC	CVVC	CVVC
Chl	CVC	CVC	CVC	CVhC	CVhC
Tzo	CVC	CVC	CVC	CVC	CVC
Toj	CVC	CVC	CV?VC	CVC	CVhVC
Chj	CVC	CVC	CV?VC	CVC	CVhVC
Jac	CVC	CVC	CVC	CVC	CVhVC
Mam	CVC	CV'C	CV?C	CV'C	CVxC?
Cak	CVC	CV'C	CV'C	CV'C	CVxC
Pch	CVC	CV'C	CV'C	CVhC	CVxC

# PROBABILITY AND STATISTICS

## Chapter 1

1.1. The probability of an event occurring is a number between 0 and 1. If the probability is 0, the event will not occur. If the probability is 1, the event will occur. If the probability is between 0 and 1, the event may or may not occur.

1.2. The probability of an event occurring is the ratio of the number of favorable outcomes to the total number of possible outcomes.

1.3. The probability of an event occurring is the sum of the probabilities of the individual outcomes that make up the event.

1.4. The probability of an event occurring is the product of the probabilities of the individual outcomes that make up the event.

1.5. The probability of an event occurring is the ratio of the number of favorable outcomes to the total number of possible outcomes.

1.6. The probability of an event occurring is the sum of the probabilities of the individual outcomes that make up the event.

1.7. The probability of an event occurring is the product of the probabilities of the individual outcomes that make up the event.

1.8. The probability of an event occurring is the ratio of the number of favorable outcomes to the total number of possible outcomes.

1.9. The probability of an event occurring is the sum of the probabilities of the individual outcomes that make up the event.

PROBABILITY



EXERCISES

- 1. Find the probability that a standard normal variable Z is greater than 1.5.
- 2. Find the probability that a standard normal variable Z is between -1.5 and 1.5.
- 3. Find the probability that a standard normal variable Z is less than -1.5.

Summary of Financial Data			
Revenue	100		100
Cost of Sales	(40)		(40)
Gross Profit	60		60
Operating Expenses	(20)		(20)
Operating Income	40		40
Interest Expense	(5)		(5)
Income Before Tax	35		35
Income Tax Expense	(10)		(10)
Net Income	25		25
Dividends	(5)		(5)
Retained Earnings	20		20
Assets	100		100
Liabilities	(60)		(60)
Equity	40		40
Current Assets	50		50
Fixed Assets	50		50
Current Liabilities	(30)		(30)
Long-Term Liabilities	(30)		(30)
Common Stock	20		20
Retained Earnings	20		20
Depreciation Expense	(10)		(10)
Amortization Expense	(5)		(5)
Provision for Doubtful Accounts	(5)		(5)
Income Tax Expense	(10)		(10)
Interest Expense	(5)		(5)
Dividends	(5)		(5)
Net Income	25		25
Operating Income	40		40
Gross Profit	60		60
Revenue	100		100





## GV correspondences





* to BELCH	CV	CV	TV	CV(C)
BELLY/INTESTINE LUNG	CV	CV	TV	CV(C)
to BLOW	CV	CV	TV	CV(C)
BURN/SHINE	CV	CV		CVC
COUGH	CV	CV	To + Huave	CVCV
to DRIP	CV	CV	To + Huave	CVC
* to PUS	CV	CV	To	CV(C)
to SHOOT	CV	CV		CVC
to small	CV	CV		CVCVC
* to STRANGLE	CV	CV	To	CVC
to SUCK/NURSE/ KISS	CV	CV	To	CV(C), CVC
to TICKLE	CV	MZ		CVCVC
to URINATE	CV		To + Huave	CVC
to	CV	MZ		CV(C)

# WIND BLOWING MAPS

ALLIGATOR			To + Tarascan	CVCCV
ATOLE				CVC
ZAPORE/PLANTAIN			To	CVCVC
CHILT				CVCV
DEER				CVCV
DRAGONFLY				CVCVC
FOX (1)			+ Huave	CVC
FOX (2)				CVC
HONEYCOMB				CVCVC
INCENSE			To + Huave	CVC
PARRA/NET			+ Huave	CVC
RABBIT			+ Huave	CVC
RAT/MOUSE	Me		To + Huave	CVC
ROAST			To	CVC
AVOCADO	Me			CVC

# Uto-Aztecan Family

## A. Plateau Group

1a Mono (Monos, Owens Valley Paiutes)

b Northern Paiute (Northern Paiutes, Bannocks)

2a Panamint

b Shoshone (Shoshones, Gosiutes)

c Comanche

3a Kawaiisu

b Ute (Utes, Chemehuevis)

c Southern Paiute

## B. Tubatulabal

## C. Southern California Group

1a Luiseño (Luiseños, Juaneños)

b Gabrielino (Gabrielinos, Fernandinos) [extinct?]

2a Cahuilla

b Cupeño

3 Serrano

## D. Hopi

## E. Piman Group

1a Papago (Papagos, Pimas)

b Tepecano

2a Northern Tepehuán

b Southern Tepehuán

- I. Yaguan Group
  - 1a Tarahumara
  - b Varohío
  - 2a Cáhita (Yaguis, Mayos)
  - b Ópata [extinct?]
- G. Coran Group
  - 1. Cora
  - 2. Huichol
- H. Aztecan Group
  - 1. Aztec (Nahuas, Pipiles)
  - 2. Pochuteco [extinct?]

# phonology

3

## Mono

p	t	c	k	k <sup>w</sup>	ʔ	i	ʌ	u
			q	q <sup>w</sup>		e	a	o
		s	x		h			
m	n							
		ɣ		w				

k and q, k<sup>w</sup> and q<sup>w</sup> are mostly in CD

very few words end in a consonant

x, -ww-, -yy- are rare

CV

CVCV

CVC<sub>2</sub>C<sub>2</sub>V (=Lamb CVhCV)

||hw|| = /qg<sup>w</sup>/    ||hy|| = /tt/

## Comanche

p	t	c	h	h <sup>w</sup>	ʔ	i	ʌ	u	V.
-v	-r	ɣ		w		e	a	o	
					h				
m	n								

Few or no words end in a consonant

-hw-, -hy- are rare or non-occurring

CV

CVCV

CVhCV

CVhCV

# English

p	t	c	k	k <sup>w</sup>		i	ɛ	u
-b-	-d-		-g-	-g <sup>w</sup> -		e	a	o
		a						
m	n	ŋ	-ŋ <sup>aw</sup> -					
		ɹ	h					

no word ends in a consonant

CV

CV<sup>h</sup> } contrast at end  
CV<sub>1</sub>V<sub>1</sub>

CVCV

C<sub>1</sub>V<sup>n</sup>C<sub>2</sub>V where C<sub>2</sub> = {p t c k k<sup>w</sup>}

## Tubatulabal

p	t	ʈ	ʈ̥	k	ʔ	i	ɛ	u	v <sup>h</sup>
-b-	-d-	-ʈ-	-ʈ̥-	-g-		e	a	o	
		ʂ			h				
m	n			ŋ					
w	l		y						

e is rare  
ʈ̥, ʂ̥ are rare  
l is rare initially

CV

CV<sup>h</sup>

CVC(V)

CV<sup>h</sup>C(V)

C<sub>1</sub>V<sup>n</sup>C<sub>2</sub>(V) where C<sub>2</sub> = {p/b t/d c/ʈ k/g h w}

## Lunenburg

p	t	ʔ	k	ʃ	kʷ	ʈ	i	u	V
	s	ʃ		x	xʷ	h	e	o	V
v	ʃ						a		
	r								
	l	ɣ			w				
m	n		ŋ						

v ʃ l x xʷ are rare initially

e o are rare or non-occurrent  
in unstressed syllables

CV (?)

CV

CVC(V)

CV·C(V)

## Cahuilla

p	t	ʔ	k	ʃ	qʷ	ʈ	i	u
	s			x	xʷ	h	e	
v	l	ʃ					a	
m	n	ɳ	ŋ					
	r	ɣ			w			

o occurs in loans from Spanish

r is rare

CV

CVC(V)

v x·l xʷ are rare initially

# Spanish

p	b	f	c	k	g	bw	t	l	ʌ	ə	u
a	a								a	a	
s	s	s	s	s	s	s	h				
l	l	l	l	l	l	l					
m	n	ɲ	ɲ	ɲ	ɲ	ɲ					
r											

e o ɔ ɔ occur in Spanish

## CV(?)

CV

v ɣ x are rare initially

CVC(V) CVCV

r f l s ɣ h<sup>w</sup> are rare

CV·C(V) CV·CV

# Hopi

p	t	c	k	q	k <sup>w</sup>	ʔ	i	ʌ
-v	r	y			w		ə	o
		s			h		e	a
m	n		ɣ <sup>x</sup>	ɣ	ɣ <sup>w</sup>			
	l							

V· V· V·

CV

Few words end in a consonant

CV:

||V:|| = V: ~ V·

CVCV

||V|| = V ~ V· ~ Ø

CV:CV



# Papago

p	t		č	k	ʔ	i	ɛ	u
b	d	-d	č̣	g			ɛ̣	o
	s	š			h			
m	n		ñ			V·	V'	
v	l							

CV (?)

CV

CVC(V)

CV·C(V)

except in word final position,

č č̣ l s ñ occur before V<sub>h</sub>

t d ɖ š n occur before V<sub>l</sub>

## Northern Tepehuán

p	t		k	-ʔ	i	ɛ	u
b	d		g			a	o
	s	š		h			
m	n	ñ					
v	r						

CV

CVCV

(others ?)

Few or no words end in a consonant

## Tambora

p	t	ʃ	k	l		i	u
h	ʒ		ŋ			e	o
		s		h			
m	n						
w	r	ɣ					

CV

CVCV

no word ends in a consonant

i and e are neutralized in unstressed position

## Echibe

p	t	ʃ	k	b <sup>m</sup>	ʔ	i	u
		s			h	e	o
v	ɬ					a	
	r	ɣ		w			
m	n					ṽ	v̇

CV, ʔV,

CV, ʔV,

CVCV

CV·CV

Few words end in a consonant

# Core

p	t	ʔ	ʃ	k	ʔ	i	ʌ	u
p <sup>w</sup>			ʃ <sup>w</sup>	k <sup>w</sup>		e	a	
			ʒ		h			
v	r		ɣ	w		✓	V <sup>•</sup>	
m	n							
m <sup>w</sup>								

[canons not worked out]

Few or no words end in a  
consonant

# Huichol

p	t	c	k	k <sup>w</sup>	ʔ	i	ʌ	u
		ʒ			h	e	a	
w	r	ɣ						
m	n							

V<sup>•</sup> + pitch and stress  
phenomena

[canons not worked out]

Few or no words end in a  
consonant

halec

p	t	(χ)	q	8	h	hw	h = P
		-l	s	f	7	w	
m	n			y	}		

i	u	V
e	o	

only n, k, and P are frequent  
initially

some dialects lack χ, having t in its  
place

CV

CV•

CVC(V)

CV•C(V)

CVCV•

CV•CV•

h = P ('saltillo') is [P] in some  
dialects, [h] in others. those with [h]  
have usually shifted some allophones of /w/  
to [h] as well.

# proto phonemes

## consonants

p	t	c	k	k <sup>w</sup>	ʔ
(v)		s			h
m	n		ŋ	(ŋ <sup>w</sup> )	
	-l-				
	-r-				
		ɣ		w	

## vowels

i	u	}	or	{	ɨ	ʌ	u
e	o				ɛ	o	
a							

patterns

roots

$C_1 \check{V}$

$C_1 \bar{V}$

$C_1 \check{V} C_2 V$

$C_1 \bar{V} C_2 V$

$C_1 \check{V}^n C_2 V$

where  $C_2$  = oral stop/affricate

affixes (?)

$C$

$CV$

morphophonemics

alternations

$CVCV \sim CV^n CV$

$C\check{V}CV \sim C\bar{V}CV$

$\|t\| \rightarrow i/c$

$\rightarrow /t$

$s \sim c$  (conditions unclear)

stem-final morphophonemic

vowels

$V^n$

$V^x$

$V^o$

code for environments noted in sound  
correspondence charts

g	conditioning is grammatical
s	by sound symbolism
ʔ	conditions not yet worked out
i	before a high vowel (*i, *e, *u)
*i	before a front vowel (*i, *e)
i	before *i
e	before *e
t	{ (initial) before a low vowel (*a, *o)   (medial) between low vowels
a	before *a
o	before *o
ʔ	before a consonant
ʔ	unstressed
m	in monosyllables
k	after k
g	after g

# initial consonants

		*p	*v	*t	*c	*s	*k	*k'
Mon	A1a	p	p	t	c	s	k;g <sup>↓</sup>	k <sup>w</sup> ;g <sup>w</sup>
Com	A2c	p	p	t	c	s	k	k <sup>w</sup>
SP	A3c	p	p	t	c	s	k	k <sup>w</sup>
Tub	B	p	p	t	f	ʃ	k;h <sup>↓</sup>	w
Lui	C1a	p	p	t	c	ʃ;s <sup>s</sup>	k;g <sup>↓</sup>	k <sup>w</sup>
Cah	C2a	p	p	t	c	s	k;g <sup>↓</sup>	g <sup>w</sup>
Ser	C3	p	p	t	c	ʃ/h <sup>≠</sup>	k;g <sup>aw</sup> ;k <sup>w</sup>	k <sup>w</sup>
Hop	D	p	p	t	c	s	k;g <sup>↓</sup>	k <sup>w</sup>
Pap	E1a	v	v	t;ɬ <sup>↑</sup>	ʃ;s <sup>↑</sup>	h	k	b
NT	E2b	v	v	t	s/ʃ <sup>≠</sup>	h	k	b
Tar	F1a	p/b <sup>g</sup>	p/b <sup>g</sup>	t/x <sup>g</sup>	c	s	k/g <sup>g</sup>	w
Cáh	F2a	p	v;p <sup>g</sup>	t	c	s	k	b <sup>w</sup>
Cor	G1	p;p <sup>aw</sup>	h;p <sup>g</sup>	t	f	ʃ	k;ɬ <sup>*</sup>	k <sup>w</sup> ;ɬ <sup>w</sup>
Hui	G2	p	h;p <sup>g</sup>	t	c	ʃ	k	k <sup>w</sup>
Azt	H1	p	ʔ;p <sup>g</sup>	t	q;ɬ <sup>i</sup>	s;ʃ <sup>i</sup>	k	k <sup>w</sup>



# initial consonants

	*p	*h	*m	*n	*ŋ	*w	*y
hmo	p	h	m	n	ŋ	w	y
Com	p	h	m	n	ŋ	w	y
SH	p	ʔ	m	n	ŋ	w, ʔ	y
Tub	p	ʔ	m	n	ŋ	w	y
Luc	p	h	m	n	ŋ	w	y
Cah	p	h	m	n	ŋ	w	y
See	p	h'	m	n	ŋ	w	y
Hop	p	h	m	n	ŋ	w, ʔ	y
Pap	p	ʔ	m	n; ñ <sup>↑</sup>	n; ñ <sup>↑</sup>	ʔ	d; ʔ <sup>↑</sup>
MT	ʔ	ʔ	m	n	n	ʔ	d
Tar	p	h/p <sup>a</sup>	m	n	n	w, ʔ	y/p <sup>a</sup>
CAh	p	h	m	n	n	w	y
Car	ʔ	ʔ	m; m <sup>w</sup>	n	n	w, h <sup>o</sup> , v <sup>o</sup>	y
Hai	p	ʔ	m	n	n	w, h <sup>o</sup>	y
Azt	ʔ	ʔ	m	n	n	w, ʔ	y

# Labial consonants

	*p	*b	*t	*c	*s	*k	*kw
Mon	pp	p	t/tt <sup>o</sup>	c/cc/h <sup>o</sup>	ss/cc/h <sup>o</sup>	g/gg <sup>o</sup> k/kk <sup>o</sup>	g <sup>w</sup> /gg <sup>w</sup> k <sup>w</sup> /kk <sup>w</sup>
Com	p/hp <sup>o</sup>	v	r/t/ht <sup>o</sup>	c/hc/d <sup>o</sup>	s/h <sup>o</sup>	k/hk <sup>o</sup>	k <sup>w</sup> /hk <sup>w</sup>
SP	p	v	r/t <sup>o</sup>	c/ɕ <sup>o</sup>	s/ɕ <sup>o</sup>	g/h <sup>o</sup>	g <sup>w</sup> /k <sup>w</sup>
Tub	p/b <sup>o</sup>	p/h <sup>o</sup>	ɬ	ɕ	ʃ	k/g <sup>o</sup> ;h <sup>o</sup>	w
Lui	p	v	ɬ	ʃ;s <sup>o</sup>	ʃ;s <sup>s</sup>	k;x <sup>o</sup>	h <sup>w</sup>
Cah	p	v	ɬ/ɬ <sup>o</sup>	s	s	k;x <sup>o</sup>	g <sup>w</sup>
Ser	p	v	t	ʃ/h <sup>o</sup>	ʃ/h <sup>o</sup>	k;g <sup>o</sup> ;x <sup>o</sup>	k <sup>w</sup>
Hop	p	v	t	c	s	k;g <sup>o</sup>	k <sup>w</sup>
Pap	p	v	t;x <sup>o</sup>	ʃ;s <sup>o</sup>	h/ɕ <sup>o</sup>	k	b
NT	p	v	t	s/ʃ <sup>o</sup>	h	k	b
Tar	p/b <sup>o</sup>	p/h <sup>o</sup>	t/r <sup>o</sup>	ɕ	s	k/g <sup>o</sup>	w
Cáh	p	v	t	ɕ	s	h	b <sup>w</sup>
Cor	p	h	t	ɕ	ʃ	k;x <sup>o</sup>	k <sup>w</sup> ;x <sup>w</sup>
Hui	p	ɬ	t	c	ʃ	k	k <sup>w</sup>
Azt	p	ɬ	t;x <sup>(i)</sup> [ɬ <sup>a</sup> ]	ɕ;x <sup>o</sup>	s;ʃ <sup>i</sup>	k	k <sup>w</sup>

after \*e, \*c merges with \*g in groups B, C, D

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Syllable Transcriptions

	CV	CH	CH	CV	CH	CH	CH	CH
Man	ɪ	h	n/nn <sup>3</sup>	ɪ	w/gg <sup>3</sup>	g	m/w/nn <sup>3</sup>	?
Fun	ʊ	h	n/hn <sup>3</sup>	ɪ	w/ʊ <sup>3</sup>	g/ʊ <sup>3</sup>	m/hn <sup>3</sup>	?
Up	ʊ	ʊ	ʊ/h <sup>3</sup>	ɪ	ʊ	g/ʊ <sup>3</sup>	ʊ/hn <sup>3</sup>	?
Tub	ɪ	h	n	ɪ	w	g	m	ɪw
Lut	ɪ	h	n	ɪ	w	g	m	ɪ
Uth	ɪ	ʊ/h <sup>3</sup>	n	ɪ	w	g	m	w
San	ɪ	h	n	ɪ	w/ʊ <sup>3</sup>	g/ʊ <sup>3</sup>	m	w
Flap	ɪ	h/ʊ <sup>3</sup>	n	ɪ	w;l <sup>3</sup>	g	m	ɪw
Boy	ɪ	ʊ	d;l <sup>3</sup>	d;l <sup>3</sup>	g	d;l <sup>3</sup>	m	g
Art	ʊ	h	r	ɪ	g	d	ʊ	ʊ
Far	ɪ	h	r	ɪ	w	g	m	w
Lab	ɪ	h	l;r <sup>3</sup>	l;r <sup>3</sup>	w	g	m	w
Fun	w	ʊ	?	ɪ	w;v <sup>3</sup>	g/r <sup>3</sup>	m;w <sup>3</sup>	?
Win	ʊ	ʊ	ʊ	ɪ	w	g	m	w
Win	ʊ	ʊ	l	ɪ	w	g;l <sup>3</sup>	m	?

# medial nasals and nasal clusters

	*n	*ŋ	*mp	*nt	*m	*ŋk	*ŋk <sup>w</sup>
Mon	n/nn <sup>g</sup>	n/nn/mm <sup>g</sup>	pp	tt	ss	kk;gg <sup>↓</sup>	kk <sup>w</sup> ;gg <sup>w</sup>
Com	n/hn <sup>g</sup>	n/hn <sup>g</sup>	p	t	ɬ	k	k <sup>w</sup>
SP	ɬ/n <sup>g</sup>	ɬ/ŋ <sup>g</sup>	mp	nt	ɾ	ŋk	ŋk <sup>w</sup>
Tab	n	ŋ	mb/mp	nd/nt	nn	nn/ŋk <sup>g</sup> ;ŋh	?
Lus	n	ŋ	p	t	ɬ	k;g <sup>↓</sup>	?
Ech	n/ñ <sup>≠</sup>	ŋ	f	t	ɬ	k;g <sup>↓</sup>	?
Sec	n/ñ <sup>≠</sup>	ŋ	p/hp <sup>≠</sup>	t	ɬ	k;g <sup>↓</sup>	?
Hyp	n	ŋ <sup>y</sup> ;ŋ <sup>↓</sup>	p	?	s	k;g <sup>↓</sup>	?
Hop	n;ñ <sup>↑</sup>	n;ñ <sup>↑</sup>	p	?	h/ɬ <sup>≠</sup>	k	?
Mt	n	n	p	?	h	k	?
Tur	n	n	p	?	s	k	?
Cah	n	n	p	?	s	k	?
Car	n	n	p	?	s	k	?
Hai	n	n	p	?	s	k	?
Azt	n	n	p	?	s	k	?



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vowels and length

	i	e	u	o	a	$\bar{v}$	$\bar{v}^m$
Men	i	e	u	o	a/e †	$\bar{v}$	$\bar{v}$
Com	i	e	u	o	a/p †	$\bar{v}$	$\bar{v}$
SP	i	e	u	o	a	$\bar{v}, \bar{v}^m$	$\bar{v}, \bar{v}^m$
Tub	i	e	u	o	a	?	?
Lui	i	e; u <sup>v</sup>	u	o; i <sup>v</sup>	a	$\bar{v}$	?
Cah	i	e	u	o	a	$\bar{v}$	$\bar{v}$
Ser	i	e; a <sup>h</sup>	u	o	a/a †	$\bar{v}$	?
Hop	i	e	u	o	a/e †	$\bar{v}$	$\bar{v}$
Pap	i	e	u	o	a	?	?
NT	i	e	u	o	a	?	?
Tar	i	e; i <sup>v</sup>	u	o	a	$\bar{v}$	$\bar{v}$
Cah	i	e	u	o	a; e <sup>h</sup>	$\bar{v}, \bar{v}^m$	$\bar{v}, \bar{v}^m$
Cor	i/e †	e/a †	e	u	a	?	?
Hui	i	e	e	u	a	?	?
Azt	i	e	i/e †	o	a/e †	$\bar{v}$	$\bar{v}$

Final vowels are lost in Tub, Lui, Cah, Ser,  
Pap, Azt

## Siouan Languages

### I. Missouri River (= Missouri = Western = Crow-Hidatsa) Branch

#### 1. Hidatsa

### III. Missouri Valley (= Mississippi = Central) Branch

#### A. Central Missouri Valley (= Mid Central = Chíwere-Winnebago) Group

##### 1. Winnebago /hočǎ́gara/

##### 2. Oto /tíwere/ (Ioways, Otos, Missouris)

#### B. Southern Missouri Valley (= South Central = Dhégiha) Group

##### 1. Omaha /ǵégíha/ (Omahas, Poncas)

##### 2. Osage /ǵegáha/ ~ /yegáha/ (Osages, Kanzas)

##### 3. Quapaw <Akansa> /akáza/ (?)

#### C. Northern Missouri Valley (= North Central = Dakota) Group

##### 1. Dakota /dakhóta/ (Tetons, Yanktons, Santees,

Assiniboin)

### IV. Ohio Valley (= Ohio = Eastern) Branch

#### 2. Biloxi

#### 3. Miami



... or a series of (X) ...

p t k s x { p h i u  
e o  
a

w { r  
m { [n] -V

p t k [b d/ɣ g]

ph th kh [p' t' x' k']

s ʃ x [z/ʒ ʒ/y ʃ] (V/#)-V

sh ʃh xh [s/θ ʃ x] -C, C-  
[s/θ ʃ x] (V/#)-V

m [m] [m']

dh [d] [d']  
s [s] [s']  
h [h] [h']  
r [r] [r']  
l [l] [l']  
n [n] [n']



Question

$P^2$	$q^2$	$W^2$	$P$	$q$	$W$	$P$	$q$	$W$	$P$	$q$	$W$
1	1	1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5	5	5	5

Answer

$P^2$	$q^2$	$W^2$	$P$	$q$	$W$	$P$	$q$	$W$	$P$	$q$	$W$
1	1	1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5	5	5	5

1.  $1 \times 1 \times 1 \times 1 \times 1$

2.  $1 \times 1 \times 1 \times 1 \times 1$

3.  $1 \times 1 \times 1 \times 1 \times 1$

4.  $1 \times 1 \times 1 \times 1 \times 1$

5.  $1 \times 1 \times 1 \times 1 \times 1$

1.  $1 \times 1 \times 1 \times 1 \times 1$

2.  $1 \times 1 \times 1 \times 1 \times 1$

3.  $1 \times 1 \times 1 \times 1 \times 1$

4.  $1 \times 1 \times 1 \times 1 \times 1$

5.  $1 \times 1 \times 1 \times 1 \times 1$

Consider a function  $f(x)$

$$f(x) = x^2 - 3x + 2 \quad \text{for } x \in [0, 4]$$

$$\int_0^4 f(x) dx = \int_0^4 (x^2 - 3x + 2) dx$$

$$= \left[ \frac{x^3}{3} - \frac{3x^2}{2} + 2x \right]_0^4 = \left( \frac{4^3}{3} - \frac{3 \cdot 4^2}{2} + 2 \cdot 4 \right) - \left( \frac{0^3}{3} - \frac{3 \cdot 0^2}{2} + 2 \cdot 0 \right)$$

$$= \left( \frac{64}{3} - \frac{48}{2} + 8 \right) - 0 = \frac{64}{3} - 24 + 8$$

$$= \frac{64}{3} - \frac{72}{3} + \frac{24}{3} = \frac{16}{3}$$

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Problems

1.  $\frac{1}{2} \times \frac{3}{4} = \frac{3}{8}$   
 $\frac{1}{2} \times \frac{3}{4} = \frac{3}{8}$

2.  $\frac{1}{2} \times \frac{3}{4} = \frac{3}{8}$   
 $\frac{1}{2} \times \frac{3}{4} = \frac{3}{8}$

3.  $\frac{1}{2} \times \frac{3}{4} = \frac{3}{8}$

Answers

1.  $\frac{1}{2} \times \frac{3}{4} = \frac{3}{8}$   
 $\frac{1}{2} \times \frac{3}{4} = \frac{3}{8}$

2.  $\frac{1}{2} \times \frac{3}{4} = \frac{3}{8}$   
 $\frac{1}{2} \times \frac{3}{4} = \frac{3}{8}$

3.  $\frac{1}{2} \times \frac{3}{4} = \frac{3}{8}$

## Mandan

p	t		k	r	i	u	ɔ	ʉ
	s	ʃ	s	h	e	o		
m								
[m]	[n]	[ŋ]						

an alternate analysis would write  $V^*$  as  $V$ , and specify that  $/r/$  and  $/w/$  as having a predictable epenthetic vowel, always short, and of specifiable quality]

## Ofo

p	t	ʃ	k	ʔ	i	u	ɔ	ʉ
f	s	[ʃ]	h		e	o		
{ [w]	{ [ɹ]	{ [ɹ]						
m	n							

Biloxi

p	t	$\begin{cases} z \\ [k] \end{cases}$	k	p	i	u	l	u
	s	[k]	x	h	e	o		
w	$\begin{cases} d \\ [l] \end{cases}$					a		a
m	n							

✓

Tutelo

p	t	c	k	p	i	u	l	u
		s	x	h	e	o		
$\begin{cases} w \\ [m] \end{cases}$	$\begin{cases} l \\ [n] \end{cases}$	$-V_n$	$\gamma$			a		a

✓

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*Excluded on most languages*

{ *Insertion of fragments in some cases only about 1/2 inch. through compression materials* }

### References

• • •

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CUEV

CC BY

LCSH

ENDNOTES





# proto Siouan clusters

$C_2 \rightarrow$

	w	p	k	s	š	x	t	r	y	ʔ	h
$C_1$	w	w.w	wp	wk	ws	wš	wx	wt	-wr- wr	wy	>'w wh
	p	#	#	pk?	ps	pš	px	pt	pr	py	pʔ
	k	#	kp	#	ks	kš	kx	kt	kr	ky	kʔ
	s	#	sp	sk	#	#	#	st	sr	sy	sʔ
	š	#	šp	šk	#	#	#	št	šr	šy	šʔ
	x	#	xp	xk	#	#	#	xt	xr	xy	xʔ
	t	#	tp	tk	#	#	#	#	#	#	tʔ
	r	#	#	#	#	#	#	#	#	#	#
	y	#	#	#	#	#	#	#	#	#	#
	ʔ	#	#	#	#	#	#	#	#	#	#
	h	#	#	#	#	#	#	#	#	#	#
		'w	'p	'k	's	'š	'x	't	'r	'y	#
											'h?

clusters where  $C_1$  is |w| or |y| occur only initially, with the noted exceptions. |.| marks a morph boundary

code for annotations noted in sound correspondence charts

A // B      A      \_oral vowel  
                  B      \_nasal vowel

A / B / C      A      initial  
                          B      medial  
                          C      final

A ~ B      freely varying or non-contrastive  
                  or A in some dialects, B in others

< >      presumably

†      conditions not yet worked out

§      conditions are grammatical

§      after front vowels

†      before front vowels

~      before a rounded vowel

~      before a non-rounded vowel

pS	W	Ot	Om	Os	Da
*h, *kh	[g]	k	g	g	h; ɛ <sup>h</sup>
*ah, *ch	[k]	kh	k	k	kh; ch <sup>h</sup>
*xk	[h]	kh		k	k
aw	w; h <sup>+</sup>    w; m; h <sup>+</sup>	w    m; w <sup>+</sup>	w    m; w <sup>+</sup>	w    m; w <sup>+</sup>	w
*ww, * <sup>c</sup> w	w; [b] ≠    m	p    m	m	b    m	w; b ≠    [m]
*p	w / [b]	p / w	b	b	p
*kp	[kV <sub>2</sub> w]	kw	p	p	kp
*-    wh    - (≡ -hw <sup>?</sup> )	w	w	h	p; p <sup>h</sup> ←	ph
*ph	w / [p]	w	h	p; p <sup>h</sup> ←	ph
* <sup>c</sup> p, * <sup>c</sup> wp	[p] /	ph /	p /	p /	ph /
*px Lhy	[pothetical]				
*h-, *wh-	h	h	h	h	h; ɛ <sup>h</sup> ≠
*- <sup>c</sup> h-	h	h	h	h	h
*-h-	h	h	ɣ    h	ɣ    h	y <sup>vu</sup> ; w <sup>vu</sup>    h
*-h ≠	ɔ	ɔ	ɔ	ɔ	ɔ
*r	r    h	r    [m]	ɣ	ɣ	y
*t	[j]	t	d	d	t
*th	[ɛ] / [j]	th	t / th	t / tx ~ kx	h
*t, *wt	[ɛ]	th	t	t	th
*pt	[ɛ]	th	t	t	pt
*tp	[ɛV <sub>2</sub> w]	tw	t	t	tp ~ kp
*tk	[ɛg]	ht	t	t; k <sup>h</sup>	tk

	Q1	Q2	Q3	Os	Da
*cr	[ɕ] [n]	t [En]	o [n; ɕ]	n [n; ɕ]	d [n]
*wr	[ɕ] [n]	t [En]	n	d [n]	bd [mn]
*-wr-	[ɕ] [n]	t [En]	ɕ [n]	bɕ; d̃ [bɕ]	bd [mn]
*pr	[p] [r]	pr	ɕ	bɕ	bd [mn]
*py		<pr>	<ɕ>	<bɕ>	<pɕ>
*y	n [n]	r [En]	ɕ; ʒ [n]	ɕ; ʒ [n]	ɕh
*c <sub>1</sub> - c <sub>2</sub>	n [n]	[ɕ]	ɕ	ʒ	ɕh
*light-				ɕ	h
*s	[z]	[z]	z	z	[z]
*we, -s	[s]	[s]	s	s	[s]
*ps	[ɕ]/ps			s	ps
*ks	ks	ks	s	s	ks
*x	[ɕ]	[ɕ]	ɕ	ʒ	[ɕ]
*x <sub>1</sub> , x <sub>2</sub>	[ɕ]	[ɕ]	ɕ	ɕ	[ɕ]
*pɕ					pɕ
*kɕ	kɕ	kɕ	ɕ	ɕ; kɕ	kɕ
*ɕ	[ɕ]	ɕ	ɕ	ɕ	[ɕ]
*wɕ, *ɕ	<ɕ>	[ɕ]	x	x	[ɕ]
*ɕ				x	[ɕ]

pS	Wu	Ch	Om	Os	Da
*p	(p)	(p)			(p)
*pʔ	pʔ	pʔ	pʔ	pʔ	pʔ
*tʔ	tʔ; tʔ <sup>g</sup>	tʔ	tʔ	[cʔ]	tʔ
*kʔ	kʔ	kʔ	ʔ	kʔ	kʔ; cʔ <sup>g</sup>
*sʔ	sʔ				sʔ
*ʃʔ	ʃʔ	ʃʔ	ʃʔ	[cʔ]	ʃʔ
*xʔ	xʔ ~ [xg]	xʔ ~ kh	ʔ	kʔ	xʔ
*kʁ	[kV <sub>2</sub> r]    [kV <sub>2</sub> n]	kʁ	gʃ	gʃ	kd    [kn]
*kʁg	[kV <sub>2</sub> r]	kʁ	gʃ	gʃ	kʃ
*sr	[sV <sub>2</sub> r]    [sV <sub>2</sub> n]	sr    [sn]	sn	st    sn	sd    [sn]
*sg		<sr    [sn]>	<sn>	<st    sn>	sʃ
*ʃr	[ʃV <sub>2</sub> r]    [ʃV <sub>2</sub> n]	ʃr    [ʃn]	ʃn	ʃt	ʃd
*ʃg		<ʃr    [ʃn]>	<ʃn>	<ʃt    ʃn>	<ʃʃ>
*xr	[xV <sub>2</sub> r]    [xV <sub>2</sub> n]	xr	xʃ	xʃ	xd
*xg		xr	<xʃ>	xʃ	xʃ
*pk [hypothetical]					
*kt	[kʔ]	ht			kt



ps	wi	ot	Um	Os	Da
*sp		sw		sp	sp
*s <sub>2</sub> p			s <sub>2</sub> p	s <sub>2</sub> p	s <sub>2</sub> p
*xp	[xV <sub>2</sub> w]	xw	xp	xp	xp
*st					st
*st	[s <sub>2</sub> y]	s <sub>2</sub> t	s <sub>2</sub> t	s <sub>2</sub> t	st
*xt		xt	xt	xt	xt
*sk	[sg]	sk	sk	sk	sk
*sk	[s <sub>2</sub> g]	s <sub>2</sub> k	s <sub>2</sub> k	s <sub>2</sub> k	s <sub>2</sub> k
*i	i	i	i	i	i
*e	e	e	e	e	e
*a	a	a	a	a	a
*o	o	o	u	u	o
*u	u	u	i	u	u
* <sup>2</sup> u	[P] <sub>0</sub>	[P] <sub>0</sub>	u	u	[P] <sub>0</sub>
*l	l	l	l	l	l
*e	e	e	e	[e]	e
*u	u	u	e	[e]	u
*i;Q†	i;Q†	i;e†	i;e	i;e	i;e; a
*e;Q	e;Q	e	e; a	e; a	e; a
*a;Q	e;Q	e; a†	a	a	a
*o;Q	o;Q†	o	u	u	o
*u;Q	u	u	i	u	u
*[A]	e~a	e~a	e~a	e~a	e~a





pS	Mi	Cr	Ma	OF	Bi	Tu
*h-	h	h	h	h	h ~ Ø	h
*-h-	h; a t	Ø	h	←	h/v/y/Ø †	→
*-h	Ø	Ø	h	Ø	Ø	Ø
*ʔ	ʔ	(ʔ)	ʔ	(ʔ)	(ʔ)	(ʔ)
*s, *ʃ	s	t; c -1	ʃ	(a)t	s	(a)s
*ʃʔ			ʃk ?			
*w [h]y	pathetical					
*ʃ, *ʃʃ, *ʃʔ	ʃ	ʃ	s	č	č	c
*wʃ	wVʃ	wVʃ	ps ?	ač	č	c
*x, *xʃ	x	x	x	s	x	x
*w x	[hypothetical]					
*pk	[hypothetical]					
*kp	[no xxx]					
*kt	ht			k(V)t	k(V)t	k(V)t
*tp	/hp	/hp	/pt			
*tk	tVr/(h)k	/(h)k	tk		t(V)k	
*xʔ	x/hk	x/hk	k ?	s	x	x

pS	Hi	Cr	Ma	Of	Bi	Tu
*kr	hVr	kVr; cVr	[kVr]		k(V)n	
*ky Inc	exx]					
*sr	cVr	tVr; cVr	[sVr]  [sVn]	fd	sn	[sVn]
*sy Inc	exx]					
*sr	sVr		[sVr]		čd	
*sy			[sVr]			
*xr	xVr	xVr	[xVr]	s(V)d		
*xy					xy	
*xp				fp	sw~sp	sp
*sp	sVp / šp	/šp		čp		
*ap	xVp	xVp			xp	
*st					st	st
*st	/st	/st	st			
*xt			xt			
*sk	ck	c(V)k	šk		sk	sk?
*šk	šk		sk	čk; kč†	čk; kč†	c(V)k
*xk	xVk	xVc xVk / xc -i	xk	sk	xk; k?	
*ps Inc	exx]					
*pš Inc	exx]					
*px Inc	exx]					
*ks	hKVC			k(V)f; f?	ks	k(V)s
*kš			ks	k(V)š	k(V)š	
*kx		k	kx	s?	x?	



# THEORY OF THE GENERALIZATION

1. The  
 2. The

3. The

4. The

5. The

6. The

7. The

8. The

9. The

10. The

11. The

# Philological Methods

1

## Cacaopera - Matagalpa

### phonemes

p      t      k                      i      u

b-      d-                      a

s      ṣ      x                      √

m(-)      n

l

-r-

w(-)

y(-)

895	M	Mendoza	}	Cac.
1895	S	Sapper		
1910	L	Lehmann		
1855	N	Noguera	}	Mat.
1909	V	Valle		

### marginal sounds

é      in one interjection

ɛ      in loans

ḳ      in one or two loans

## phonetics

n #	nt ~ n ~ n
p #	p <sup>m</sup> ~ p
t #	t <sup>n</sup> ~ t
s #	s <sup>n</sup> ~ s
-b-	b ~ β or else: /b/ may be spirantized after $\acute{V}$
ü final	u <sup>f</sup> ~ o (cac.) / o (mat.)
medial	u                      o
ĩ final	i <sup>f</sup> ~ e
medial	i                      i
a	y-, -y              a ~ æ ~ ε

p (t) (k) s (m) n l may be slightly lengthened in  $\acute{V}-V$

#p, t ~~and~~  $\acute{V}$  are lenis, and are frequently transcribed by S as b, d; but by no one else.

Lehmann frequently hears stressed vowels and pretonic vowels in open syllables as long. None of the other sources marks length in any way. Since many of the forms are marked by L both with and without length, it is assumed to be non-distinctive.



		M	S	L	N	V
#p	- $\check{V}$	p	p	p		
#p	- $\check{V}$	p	b	p		
#t	- $\check{V}$	t	t(d)	t		
#t	- $\check{V}$	t	d	t		
#k	- $\check{V}$	c, k	c, qu, k	k		
#b	- $\check{V}$	b	b	b		
#d	- $\check{V}$	d	d(nd)	d		
s	$\check{V}$ - $\check{V}$	s	ss	s		
s	$\check{V}$ - $\check{V}$	s, ss	s	s		
p	$\check{V}$ - $\check{V}$	pp	p	p	p, pp	p
p	$\check{V}$ - $\check{V}$	p	p	p		
t	$\check{V}$ - $\check{V}$	t	t	t		
t	$\check{V}$ - $\check{V}$	t	t(d)	t		
k	$\check{V}$ - $\check{V}$	c	c, qu	k		
b	$\check{V}$ - $\check{V}$	b, v	b, v	b		b
b	$\check{V}$ - $\check{V}$		b	b		
d	$\check{V}$ - $\check{V}$	d		d		
m	$\check{V}$ - $\check{V}$	m	m	m		m
n	$\check{V}$ - $\check{V}$	n	n, nn	n	n	
n	$\check{V}$ - $\check{V}$	n	n	n		
l	$\check{V}$ - $\check{V}$	l	l, ll	l		
	$\check{V}$ - $\check{V}$	l	l	l	l	



M

S

L

p#       $\acute{V}$ —t#       $\acute{V}$ —k#       $\acute{V}$ —n#       $\acute{V}$ —n#       $\check{V}$ —#š      — $\acute{V}$ š       $\acute{V}$ — $\check{V}$ š       $\check{V}$ — $\acute{V}$ š#       $\acute{V}$ —

#yá—

—uá—

—iá—

—ai—

—au—

—ui—

—iu—

yáu

yáu

yáu

yáu

yáu

yáu

yáu

yáu

yáu

yáu

t

c

n

n

n

r

rr

rr

r,s

ye,ya

o

ia

ay,ai

áu

ihú, eo

yáu

yáu

yáu

yáu

yáu

yáu

yáu

yáu

yáu

yáu

pm

t,tn,t<sup>n</sup>

c

n,nn,n̄

n

r,rr

r,rr

rr

rx,rrx

ye,ya

ó

ié

ai

áu

uy

yáu

yáu

yáu

yáu

yáu

yáu

yáu

yáu

yáu

yáu

yáu

p<sup>m</sup>t<sup>n</sup>,t

k

n,nt

n,nt

ř,š

řř

řř,ř,rr,r(r)

řř,ř,š<sup>n</sup>

ye,ya

ó,o.wá

i.é

ai

á·u,áu

u.i

C.u,iú,io

yáo

yáo

yáo

yáo

yáo

yáo

yáo

yáo

yáo

yáo

p

n

n

n

n

n

n

n

n

n

n

n

n

n

n

n

n

n

n

n

n

n

n

n

extra

extra

marginal

"

"

"

oo

u<sup>(-y)</sup>u<sup>(-y)</sup>

ia

ia

ai,éi

áu

áu

u.i

C.u,iú,io

yáo

yáo

yáo

yáo

yáo

yáo

yáo

yáo

yáo

yáo

yáo

yáo

yáo

yáo

M

S

L

* x	- $\check{V}$			x		
x	$\check{V}-\check{V}$	j	j	x		
* i-		i	i	i		
* $\check{V}$ -		i	i	i		
- $\check{V}$ -		i	i	i	i	i
-i #		i	i	i		
- $\check{V}$ #		i,e	i,e	i,e	e	e
* u-		u	u	u		
* $\check{u}$ -		u	u	u		
- $\check{u}$ -		u,o	u,o	u,o	o	o
-u #		u	u	u		
- $\check{u}$ #		u,o	u,o	u,o	o	o
-uk #		uc	uc	uk,ok		
#-	-V	h,Ø	Ø	Ø		

	b		N		V	
	M	S	L			
-sw-			sw, zw			
-lb-	lb		lb, lw			
-lk-		lk	lk, tk			
-nd-	nd		nd			
-tb-	db	tp	tb	tb		
-kt-		t	kt	ct		
-sn-	sn	sn	sn			
-lk-	lc, lk	lc	lk			
-sm-	sm	sm	sm			
-nk-	nk		gk			
-sk-	sk		sk			
-nt-	nt	nt		nt		nt
#dr-				dr		dr
-hy-				ji		

# Tapachulteco

7

probable phonemes

p t ɸ ɕ k ʔ

ʃ h

m n

w y

i ʌ u ɨ

e a o

M	Mendoza (by Sapper)	ca 1920
S	Sapper	ca 1890
K	Krause	ca 1910
R	Rieke	ca 1900
J	Johnston	ca 1880

# Tapachulteco

8

h

M

S

K

R

J

k -i/e

qu(k')

k'/qu(k'u)

(qu)

(cu)

qu

k -a/o/u/ɛ

g/c/k(c')

c/k'(h,k)

c/g

c(g)

c/g

k -#

c/k

c/k

g/c

c/ɔ

que/tca/c(co,

~~h~~

h V-V

j(h)

(j)h

j

h(S)

j(h)

h V-C

j

j

(j)

h V-C

(x,ɔ)

j(ɔ)

ɔ

j(ɔ)

ɔ

p

p/b(v)

p/b

p/b(pf)

p/b

p/b

t

t/d

t/d

t

t

t

m

m

m

m

m

m

n (non-final)

n

n

n

n

n

i

i

i

i

i

i

e

e

e(è,ö)

e

e

e

a

a

a(a')

a

a

a

o

o

o(u)

o

o

o(u)

u

u

u(u')

u

u(o)

u(o)

n -#

ng/n(m)

ng/n

n

n(m)

n(m,nt)

	g	m	s	k	r	j
✓		✓	✓	✓	✓	✓
✓ -#		v	v	v(Vg)	v	v(Vg)
✓ #-		v	v	v	v(gV)	v/h

unmarked stress is assumed to follow the rules of Spanish orthography

f	#-, V-V	} tz(ts)	tz	z(s)	ts	} z/ch x/ts
φ	-C, -#					
ç		ch	ch	—	(tx, ch)	ch
ç		x	x(s)	x	x	ch/z/c (xch, x)
y	#-, V-V	y	y	} y	y(j)	y/ll
y	-C, -#	i(y)	i(y, 'i)			
u	#-V, V-V	vu/v(u)	v/u	—	—	(hu, gü)
u	-C, -#	u	u	u	(u)	u(hu)
ø	✓-C	ø/j(c)	(k/c, t)	(g)	(g)	(t, c)
ø	-#	ø(✓)	ø/✓	ø(t)	ø(g)	c/t/ø
✓ <sub>1</sub>	-C	v(V, V <sub>1</sub> )	V <sub>1</sub> V <sub>1</sub> /V <sup>c</sup>	v	—	V <sub>c</sub>
ø		o	o(ö)	o	o(u)	u/o(un)
ø		e/ó/o	ö/o	—	—	e(i, o)

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Languages of Middle America

T. Sauer



Language and Families of Middle America (I-XXIII)

[A. macro-Hokan superstock]

I. San Blas [isolate] (Driver: Oasis; Kroeber: Southwest)

II. Tlapanecan family 8c.

a. Tlapaneco

b. Sothlaba [intrusive outlier] (Driver: Circum-Caribbean)

III. Tequistlatec[an] (Coastal, Highland var's.)

IV. Jicaque [isolate] (Driver: Circum-Caribbean)

[B. macro-Aztec-Tanoan superstock]

7. Mac-Aztec family 47-50c. (in part: the traditional Sauaman and Aztec 'branches')

A. Pima group 3-7c. (Driver: Oasis; Kroeber: Southwest)

1. (a) Papago (Pima and Papago var's.), Inner Pima;

(b) Tepecano [intrusion]

2. (a) Northern Tepehuán; (b) Southern Tepehuán [intrusions]

F. Yaquian group 21c. (Driver: Oasis)

1. Tarahumara-Guarijío 7c.

a. Tarahumara [intrusion]

b. Guarijío [Eng. Varohío]

2. Cáhita-Ópata 11c.

a. Cáhita (Yaqui, Mayo var's.)

b. Ópata (Eudeve, Jova var's.)

G. Coran group 11c.

1. Cora

2. Huichol

H. Aztec group [intrusions] 13c.

1. Azteco 12c. (sev. dial's., e.g. Isthmus, Highland, Puebla, Michoacán)

2. Pochuteco

VI. Quitlatec [isolate]

[C. macro-Penutian superstock]

VII. Tarasco [Eng. Tarascan][isolate]

[D. macro-Mayan superstock]

VIII. Totonacan family 26c.

A. Totonaco [Tol., Totonaco] (rev. dialect, e.g. Highland, Totonaco)

B. Tepehua

IX. Mixe-Zoque family 35c.

A. Zoque group

1. Zoque (Chiapas and Oaxaca var's.)
2. Sierra Popoluca
3. Texistepec Popoluca

B. Mixe group

1. Mixe (Western and Eastern var's.)
2. Sayula Popoluca
3. Oluta Popoluca
4. Tapachulteco

X. Mayan family 36-39c.

A. Huastecan group [outliers] 10c.

1. Huasteco (Potosino and Veracruzano var's.)
2. Chicomucelteco

B. Yucatecan group 6c.

- a. Yucateco (Yucateco and Itzá var's.)
- b. Lacandón
- c. Mopán

C. Cholan group 13c.

1. Chontal-Chol 7c.
  - a. Chontal
  - b. Chol
2. Chortí

D. Tzeltalan group 18c.(!)

1. Tzotzil-Tzeltal 7c.

a. Tzotzil

b. Tzeltal

2. Tojolabal

E. Kanjobalan group 15c.

1. Chuj

2. Kanjobal-Jacalteco

a. Kanjobal (Kanjobal and Solomeco var's.)

b. Jacalteco

3. Motocintleco

F. Mamean group 21c.(!)

1. Ixil

2. Aguacateco-Mam 16c.(!)

a. Aguacateco

b. Mam

G. Quichéan group 8c.

a. Uspanteco

b. Quiché

c. Achí (Rabinal and Cubulco var's.)

d. Cakchiquel (Cakchiquel and Tzutujil var's.)

H. Kekch'ian group 19c.

1. Pocomam-Pocomchí 11c.

a. Pocomam

b. Pocomchí

2. Kekchí

~~IX. Yucatan group, including the Yucatan and the Yucatan group~~

XI. Xincan family 17c.

1. Chiquimulilla

2. Yupiltepec

XII. Lenca family 30c.

A. Lenca

B. Chilanga

[F. macro-Chibchan superstock]

XIII. Paya 10c. [isolate]

XIV. Misquito-Sumu family 43c. (+ Mat)

1. Misquito

2. Sumu 11c. (Sumu, Yuma and Taguana varieties)

XV. Matagalpa 10c.

a. Matagalpa variety (A)

b. CaGaopera variety (B)

[G. macro-Oto-Mangue superstock]

XVI. Otomí-Pame family 60c. (?)

A. Pamean group 36c.

1. Chichimeco

2. North Pame; South Pame 18-20c.

3. Matlatzinca; Ocuilteco (C)

B. Otomí group 16c.

1. Otomí Gr. (sev. dial's., e.g. Eastern, Mesquital, St. of México)

2. Mazahua

XVII. Popolocan family 24-25c.

A. Ixcateco 10c. (sev. dial's., e.g. Highland, Lowland)

B. Chocho-Ixcateco group 13c.

1. Chocho

2. Popoloca [Eng. Popoloc]

3. Ixcateco

XVIII. Mixtecan family 43c; 45-49c. (+ Amz)

A. Trique

B. Cuicateco-Mixteco 25c.

1. Cuicateco

2. Mixteco 15c. (sev. dial's., e.g. Highland, Lowland, Eastern, Gueriero)

XIX. Amuzgo [isolate]

XX. Chiricahuan 15c. (Luisana, Palenque, Ojitepec, Chiltepec, Delle var's.)

XXI. Zapotecan family 24c.

A. Zapoteco 14c. (sev. dial's., e.g. Valley, Isthmus, Highland)

B. Chatino

XXII. Huave [isolate]

XXIII. Manguan family [intrusions] 13c.

a. Chiapaneco

b. Mangue [outlier] (Driver; Circum-Caribbean)



Notes:

var.        variety  
c.        centuries of divergence, from Swadesh 1956-1962  
+        including  
(%)        I think the figure is excessive  
sev.        several  
dial.        dialect  
e.g.        for example

Classification marked 1, 2 imply rather weak differentiation;  
those marked 1, 2 imply rather strong differentiation;  
those marked A, B denote the major branches of a family.

Language names ending in -ese are normally Anglicized to -ic.

-[and] means that it is unclear whether the name refers to a  
strongly diversified language or to a weakly diversified  
family.

An Oto-Manguean stock or superstock including XVI-XXII is  
generally accepted, but the subclassification of XVII-XXII is in  
doubt. This is the only superstock which has been validated  
by published phonological reconstruction.

There is general agreement on the Utoan affinities of I-III,  
and on a special relationship of I to the Iuman family. IV is  
grouped with Hokan by Greenberg and Swadesh.

A macro-Nayan stock or superstock including VIII-XI seems  
reasonable to Kaufman, Madgeon, and Swadesh among others, but is  
by no means generally accepted.

A Macro-Algonquian stock including III and IV has been proposed, and  
is reasonable to Dixon, Greenberg, and Kaufman, apparently also Madgeon.

Those who have worked more thoroughly on languages of South America lump VIII-XV with the Chibchan family to form a macro-Chibchan superstock; cf. Mason, Greenberg, Swadesh.

There are a special relationship between II-III; Iroquo and Iroquoian (not those with 'macro-Iroquoian' or 'macro-Pennsylvanian' (which are not necessarily conceived as mutually exclusive); Greenberg (1953) refers to 'macro-Chibchan' and says nothing of Xincan.

According to Driver's analysis of North American linguistic areas, I and V 5-8 belong to the Osage area; Greenberg's analysis places I and V 8-10 in his Southwest area. Driver and the authors of the Handbook of South American Indians assign III-IV to the Cisum-Andean area, but Greenberg to Middle America. The remainder of the languages are assigned by both Greenberg and Driver to Middle America (Driver Meso-America).

I have defined Middle America in such a way as to avoid breaking up the territorial continuity of Iroquo-Andean. There is general agreement that the area included shows more cultural features with Middle America in the widest extent than with any other adjacent area. Greenberg's Middle America extends somewhat past IV and V into the area of the Chibchan family, but since it would be impossible to include the whole of the geographically continuous part of the Chibchan family in anybody's definition of Middle America, I have drawn the line at the Eastern limit of IV and V. In this way, almost all of the identified outliers of Middle American languages are also included.

Whatever is indicated in the preceding listing is the form entered on my map of Middle American languages.



An Alphabetical Listing of Middle American Language  
and Tribal Names (and Place Names where they Enter  
into Language Names) with Specification of Angliciz-  
ing Terminology and Classification Coding. [Unclassi-  
fied extinct languages not listed]

+ = reported extinct during or before the 19th c.

rules for interpreting phonemic symbols:

1. vowel symbols:

i		e
I		U
e	ə	o
ɛ	ʌ	ɔ
æ	a	

$\check{V} = V$  or ə

æ = æ or a

æ̃ = æ inalterable

e\_r = e or ɛ

o\_r = o or ɔ

t\_e = t or d

t̃ = t inalterable

ɹ = ɹ or ʀ

ɹ̃ = ɹ or ʀ

n\_velar = n or ŋ

0001 /631/ 000

Aguacatec /áwákotek/ XF2a

Amuzgo /ámúzgo/ XIX

Aztec /æztæk/ VH1

Aztecan /æztékon/ VH

B ; see V

← Basiroa = Lower Pima VE1(a)

C-; see S-

Cacaopera /kakäopére/ XVb

Cáñita /káñite/ VF2a

Cakchiquel /kækčĭkél/ XGa

Chañabal, Chaneabal = Tojolabal XD2

Chatino /čætino/ XXIB

Chiliquana /čilápanek/ VIIIa

Chiapas /čiápas/

Chichimec /čičimek/ XVIA1

Chicomuceltec /čikömüseltek/ XA2

Chilanga /čilángo/ XIIB

Chimalapa = Zoque IXA1

Chinantec /činontek/ XX

+Chinipa = Tarahumara VF1a

Chiquimulilla /čikimúliə/ XII

Chocho /čóčo/ XVIIIB1

Puebla Chocho = Popoloc XVIIIIB2

Chol /čól/ XC1b

Chontal /čontál/ XC1a

Oaxaca Chontal = Tequistlatec[an] III

Tabasco Chontal = Chontal XC1a

+Chorotega /čorötége/, Choluteca = Mangue XXIIb

Chortí, +Choltí XC2

Chuchón = Chocho XVIIIB1

Chuj /čúx/ XE1

+Conicari = Cáhita VF2a

Cora /kóre/ VG1

Cubulco = Achí XGe

Guicatec /kwíkətek/ XVIIIIB1

Quitlatec /kwítlətek/ VI

+Diri(a) = Mangue XXIIIB

Eudeve = Ópata VF2b

Gu-; see Hu-

Guarijío /warĩxío/ VF1b

+Guasave = Cáhita F12a

+Guazápar = Guarijío VF1b

Guerrero /gěréro/

H-; see J-

Heve = Eudeve VF2b

Hu-; see Gu-

Huastec /wástek/ XA1

Huastecan /wastékən/ XA

Huave /wáve/ XXII

Huichol /wičól/ VG2

-i; see -e

Itzá = Yucatec XBa

Ixcatec /ĩškətek/~ /iskətek/ XVIIB3

Ixil /išíl/ XF1

J-; see H-, S-, and X-

Jacaltec /xákáltek/ XE2b

Jicaque /xikáke/ IV

Jonaz = Chichimec XVIA1

Jova = Ópata VF2b

Kanjobal /kanxobál/ XE2a

Kekchí /kekčí/ XH2

L ; see R

Lacandón /lækǎndón/ XBb

Lenca /lénke/ XII(A)

Macoyahui = Cáhita VF2a

Mam /mǎm/ XF2b

Mamean /mámien/ XF

+Mangue /mǎnge/ XXIIIb

Maribi(o) = Subtiaba IIb

Matagalpa /mætégǎlpe/ XV(a)

Matlame = Ocuiltec XVIA3

Matla(1)tzinca /mætlətsínke/ XVIA3

Maya /mǎye/ = Yucatec XBa

Mayan /máyen/ X

Mayo /mǎyo/ = Cáhita VF2a

Mazahua /mǎsáwe/ XVIB2

Mazatec /mǎsetek/ XVIIA

Meco = Chichimec XVIA1

Mexicano = Aztec VHI

Michoacán /míčuékán/

Michoacano = Tarascan VII

Mísquito /mískito/ XIV1

Misumalpan = Mísquito-Sumu (XIV) + Matagalpa (XV)

Mixe /míxe/ IXB(1)  
 Mixe-Zoque /míxe sóke/ IX  
 Mixtec /míštsek/~ /místsek/ XVIIIIB2  
 Mixtecan /míštéken/~ /místéken/ XVIII  
 Mopán /mopán/ XBc  
 Motocintlec /motósíntlek/ , Mototzintlec XE3  
 Mosquito = Misquito XIV1  
  
 Nagrañda = Subtiaba IIb  
 Nahuatl /náwā/, Náhuatl(1) /náwat(1)/ = Aztec VH1  
 Nayarit /nayārit/  
 Nayarit(a) = Cora VG1  
 Nevome = Lower Pima VE1(a)  
 +Nicarao, Niquira = Aztec VIII  
 +Nicoya = Mangue XXIIIB  
 Nílo = Cáhita VF2a  
  
 -o; see -u  
 Oaxaca /wəxáke/  
 +Ocoroni = Cáhita VF2a  
 Ocuiltec /okwíltsek/ XVIA3  
 Oluta /olúte/ IXB3  
 Opata /ópete/ VF2b  
 +Orotiña = Mangue XXIIIB  
 Otomí /otómí/ XVII  
  
 Pame /páme/ XVIA2  
 Papago /páepago/ VE1(a)  
 Paya /páyə/ XIII  
 Petén = Yucatec XBa  
 Pima /píme/ = Papago VE1(a)



Pima Bajo = Lower Pima VE1(a)  
 Lower Pima VE1(a)  
 Pipil = Aztec VH1 /pipíl/  
 Pirinda = Matlatzinca XVIA3  
 Pochutec /počútsk/ VH2  
 Pocomam /pokomám/ XH1a  
 Pocomchí /pokomčí/ XH1b  
 Popoloc /pópölok/ XVIIB2  
 Popolocan /popöLöken/ XVII  
 Popoluca /popölúke/ IX; A2-3, B2-3  
 Puebla /pwéble/  
  
 Qu-; see K-  
 Quiché /kičé/ XGb  
  
 R ; see L  
 Rabinal = Achí XGc  
 Rarámuri = Tarahumara VF1a  
  
 S-; see C-  
 Sayula /sayúle/ IXB2  
 Seri /séri/ I  
 Sierra /siére/  
 +Sinaloa /sinelöe/ = Cáhita VF2a  
 Solomec /sólömsk/ = Kanjobal XE2a  
 Sonora /senóre/  
 Subinhá = Tojolabal XD2  
 Subtiaba /sUbtíábe/ IIa  
 Sumu /súmu/ XIV2  
 Supanecan = Tlapanecan II



- Taguasca, Tahuajca = Sumu XIV2  
 Tapachultec /tæpəčũltək/ IXB4  
 Tarahumara /taräumäre/ VF1a  
 Tarascan /terəsken/ VII  
 Teco = Cuitlateco VI  
 Tegüima = Ópata VF2b  
 +Tehueco = Cáhita VF2a  
 +Temori = Tarahumara VF1a  
 +Tepahue = Cáhita VF2a  
 Tepecano /tspěkáno/ VE1(b)  
 Tepehua /těpéwe/ VIIIB  
 Tepehuán /tspěwán/ VE2  
 Tequistlatec /těkís(t)lətsk/ III  
 Tequistlatecan /těkís(t)lətéken/ III  
 Texistepec /teksístěpsk/ IXA3  
 Tlapanec /tləpənsk/ IIa  
 Tlapanecan /tləpəněken/ II  
 Tojolabal /toxöläbál/ XD2  
 Totonac /tótənæk/ VIIIA  
 Trique /tríke/ XVIIIA  
 Tz-; see Z-  
 Tzeltal /tsəltál/ , Tzentäl XD1b  
 Tzotzil /tsotsíl/ XD1a  
 Tzutujil /tsutsũxíl/ = Cakchiquel XGd  
 Ulua /úlue/ = Sumu XIV2  
 Uspantec /űspāntek/ XGa  
 Uto-Aztecan /yũto əztéken/ V  
 Varohío = Guarijío VF1b

X-; see J-, S-

Xinca /šínke/ XI

Yaqui /yáki/ = Cáhita VF2a

Yopi, Yope = Tlapanec Ila

Yucatec /yúketek/ XBa

Yupiltepec /yupíltěpek/ XI2

Z-; see Tz-

Zapotec /zəpetek/ XXIB

Zapotecan /zəpetéken/ XXI

+Zoe = Cáhita VF2a

Zoque /sóke/ IXA(1)

+Zuaque = Cáhita VF2a

Extinct forms of Middle American speech generally classified as  
Uto-Aztecan, but not reliably placed in any specific subgroup

- + Acaxée
- + Caxcán
- + Huite
- + Moꝛorito
- + Xixime